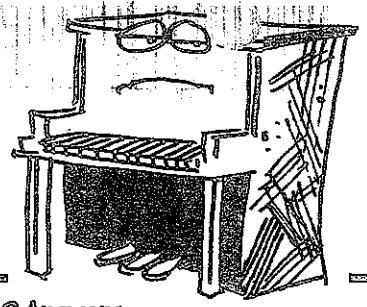
Name _____ Block _____

Why Didn't the Piano Work?



Factor the expression. Find a factor in each of the two answer columns. One factor will have a letter and the other a number. Write the letter in the matching numbered box at the bottom of the page.

Set 1

a. $x^2 - 6x$

b. $2x^2 + 8x$

c. $45x^2 - 20x$

d. $9x^3 + 30x$

e. $8x^5 - 15x^3$

Set 1 Answers

11. x^3	T. $(3x^2 + 10)$
6. $2x^2$	O. $(x - 6)$
24. $2x$	V. $(8x^2 + 15x)$
2. $3x$	S. $(9x - 4)$
16. x	F. $(3x^2 - 4)$
14. x^2	N. $(8x^2 - 15)$
8. $5x$	A. $(x + 4)$

Set 3

a. $m^3n + 9m^2n$

b. $10m^3n^2 - 25m^2n^3$

c. $49m^5n^3 + 28mn^4$

d. $72m^7n + 24n$

e. $8m^3n^4 - 22m^5n^6$

Set 3 Answers

10. $5m^2n^2$	L. $(4 - 11m^2n^2)$
7. $24n$	P. $(7m^4 + 4n)$
18. $7mn^4$	S. $(2m - 5mn^2)$
1. m^2n	W. $(3m^7 + 1)$
12. $2m^3n^4$	I. $(m + 9)$
22. $7mn^3$	L. $(4 - 11mn^3)$
5. $8mn$	O. $(2m - 5n)$

Set 2

a. $8a^3 + 4a^2 + 12a$

b. $7a^4 - 35a^3 - 14a^2$

c. $6a^8 + 10a^6 - 3a^4$

d. $36a^3 - 24a^4 + 60a^5$

e. $30a^6 - 75a^5 - 15a$

Set 2 Answers

7. $2a^2$	Y. $(a^2 - 5a - 2)$
6. a^4	P. $(2a^5 - 5a^4 - 3)$
15. $15a$	T. $(3 - 2a + 5a^2)$
13. $7a^2$	K. $(2a^2 + a + 3)$
9. $3a^2$	H. $(2a^5 - 5a^4 - 1)$
4. $4a$	O. $(6a^4 + 10a^2 - 3)$
19. $12a^3$	N. $(3 - 2a - 5a^3)$

Set 4

a. $40x^2 - 100xy - 80y^2$

b. $12x^5y^2 + 9x^4y^2 - 6x^3y^2$

c. $15x^3y - 35x^2y^2 + 40xy^3$

d. $144x^8y^2 + 27x^4y + 9x^2$

e. $2\pi x^2 - \pi y^2$

Set 4 Answers

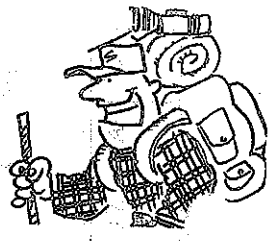
17. $5xy$	R. $(4x^2 + 3x - 6y)$
21. $3x^2y$	N. $(16x^6y^2 + 3x^2y + 1)$
5. $9x^2$	O. $(2x^2 - 5xy - 4y^2)$
3. $5x^2$	Y. $(4x^2 + 3x - 2)$
25. $3x^3y^2$	L. $(2x^2 - y^2)$
23. π	S. $(3x^2 - 7xy - 4y^2)$
20. 20	W. $(3x^2 - 7xy + 8y^2)$

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25

Factoring Polynomials: Factoring Out a Monomial

FACTOR PACKET 13.2

Why Did the Backpacker Carry a Flashlight?



Write the exercise letter in the box containing the number of the answer.

Find the greatest common factor.

(E) $10x + 35$

(O) $4x^2 - 15x$

(A) $20x^2 + 36x$

(H) $11x^3 - 2x^2$

(T) $24x^3 - 64x^2 + 40x$

(S) $60x^4 + 70x^3 - 10x^2$

answers

(21) $5x^3$

(28) $4x$

(7) $8x$

(19) 5

(3) $2x^2$

(24) $10x^2$

(12) x

(17) x^2

Find the greatest common factor.

(D) $10a^2b + 16ab^2$

(F) $11a^3b - 2a^2b^4$

(H) $36a^4 + 27a^3b$

(A) $3a^2b^2 + 18ab^3 - 33b^4$

(L) $4a^4b^2 - 9a^3b^3 + a^2b^4$

(N) $75a^5b^3 + 30a^3b^5 - 60ab^7$

answers

(2) a^2b

(5) $3b^2$

(27) a^4b

(20) $15ab^3$

(22) $9a^3$

(9) $2ab$

(15) a^2b^2

(4) $5ab^2$

Simplify the expression.

(O) $\frac{8t + 12}{4}$

(T) $\frac{2t^2 - 9t}{t}$

(E) $\frac{15t^2 + 20t}{5t}$

(I) $\frac{6t^3 - 11t^2}{t^2}$

(H) $\frac{4t^3 + 18t^2 - 10t}{2t}$

(L) $\frac{-9t^4 - 60t^3 + 3t^2}{-3t^2}$

answers

(23) $6t - 11$

(10) $3t - 11$

(27) $2t + 3$

(8) $3t + 4$

(14) $3t^2 + 20t - 1$

(11) $2t - 9$

(25) $3t^2 - 10t - 1$

(1) $2t^2 + 9t - 5$

Simplify the expression.

(W) $\frac{8a^2b + 3ab^2}{ab}$

(D) $\frac{12ab^2 - 40a^2b}{4ab}$

(G) $\frac{7a^5b^4 + 49a^4b^5}{7a^2b}$

(N) $\frac{-10a^3b + 30ab^3}{-2ab}$

(L) $\frac{18a^7b^5 + 45a^5b^3 + 9a^3b}{9a^3b}$

(I) $\frac{15a^4b^4 - 3a^4b^5 - 6a^3b^6}{3a^2b^3}$

answers

(16) $a^3b^3 + 7a^2b^4$

(4) $8a + 3b$

(6) $5a^2 - 15b^2$

(29) $3b - 10a$

(18) $5a^2b - a^2b^2 - 2ab^3$

(21) $2a^4b^2 + 5ab^2 + 1$

(26) $2a^4b^4 + 5a^2b^2 + 1$

(13) $5a^2b - 2a^2b^4 + ab^3$

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29

What Happened to the Guy Who Lost the Pie-Eating Contest?

Write the expression in factored form. Find your answer below and cross out the letter pair next to it. For each letter pair that you DON'T cross out, write the upper case letter in the box containing the lower case letter.

1. $n^2 + 7n + 12$	4. $w^2 + 13w - 30$	7. $p^2 + 5p - 14$	10. $x^2 + 7xy + 10y^2$
2. $n^2 - 9n + 14$	5. $w^2 - w - 30$	8. $p^2 - 21p + 20$	11. $x^2 + 4xy - 32y^2$
3. $n^2 + 4n - 12$	6. $w^2 + 19w + 18$	9. $p^2 - 8p - 20$	12. $x^2 - 11xy + 10y^2$
h • E $(n-2)(n+7)$	e • F $(w+5)(w-6)$	t • N $(p+2)(p-10)$	j • I $(x-2y)(x+5y)$
s • O $(n+3)(n+4)$	j • R $(w+1)(w+18)$	e • C $(p-2)(p+10)$	g • S $(x-4y)(x+8y)$
b • T $(n-2)(n+6)$	s • E $(w-3)(w+10)$	p • L $(p-2)(p+7)$	t • D $(x-2y)(x+16y)$
n • I $(n-2)(n-6)$	c • U $(w-2)(w+15)$	k • O $(p-1)(p-20)$	f • H $(x-y)(x-10y)$
q • V $(n-2)(n-7)$	b • H $(w+3)(w+6)$	q • E $(p-2)(p-7)$	o • T $(x+2y)(x+5y)$

13. $u^2 + 3u - 70$	16. $c^2 + 16c + 48$	19. $m^2 + 25m + 100$	22. $a^2 + 4ab - 21b^2$
14. $u^2 - 33u - 70$	17. $c^2 + 2c - 48$	20. $m^2 - 15m - 100$	23. $a^2 + 17ab + 72b^2$
15. $u^2 + 14u + 13$	18. $c^2 - 19c + 48$	21. $m^2 + 15m - 100$	24. $a^2 - 18ab - 40b^2$
m • R $(u+2)(u-35)$	r • V $(c-3)(c-16)$	u • E $(m+5)(m-20)$	r • N $(a-4b)(a+10b)$
r • Y $(u-7)(u+10)$	g • M $(c-3)(c+16)$	m • S $(m-5)(m-20)$	a • T $(a-3b)(a+7b)$
p • K $(u-1)(u+13)$	o • E $(c-6)(c+8)$	l • T $(m+5)(m+20)$	o • C $(a-3b)(a+20b)$
f • L $(u+1)(u+13)$	a • T $(c+4)(c+12)$	d • R $(m-5)(m+20)$	i • S $(a+2b)(a-20b)$
c • E $(u+7)(u-10)$	k • N $(c+6)(c-8)$	f • A $(m+10)(m-10)$	l • I $(a+8b)(a+9b)$

a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u

Why Is It Better to Be Married to a Successful Broadway Producer Than a Plumber?

Write the expression in factored form. Find your answer below the exercise. Then write the letter of the exercise in the box that contains the number of the answer.

E. $a^2 + 6a - 7$

A. $a^2 + 3a - 10$

L. $a^2 - 5a - 6$

U. $a^2 - 2a - 15$

S. $a^2 + 9a - 22$

O. $a^2 + 4a - 12$

H. $a^2 - 23a - 50$

F. $k^2 - 7k - 18$

U. $k^2 + 13k - 30$

A. $k^2 - 5k - 24$

E. $k^2 + 34k - 35$

S. $k^2 - 3k - 28$

L. $k^2 + k - 72$

T. $k^2 - 8k - 65$

B. $x^2 + 8xy - 20y^2$

L. $x^2 - 8xy - 33y^2$

H. $x^2 + 11xy - 80y^2$

A. $x^2 - 9xy - 36y^2$

S. $x^2 + 5xy - 36y^2$

U. $x^2 - 16xy - 36y^2$

F. $x^2 - 36y^2$

Answers

17. $(a-2)(a+7)$
5. $(a+1)(a-6)$
3. $(a-5)(a+10)$
9. $(a-2)(a+6)$
15. $(a-1)(a+7)$
13. $(a+1)(a-10)$
24. $(a+3)(a-5)$
20. $(a-2)(a+5)$
26. $(a+2)(a-25)$
22. $(a-1)(a+5)$
18. $(a-2)(a+11)$

Answers

25. $(k+4)(k-7)$
4. $(k-3)(k+10)$
1. $(k+3)(k-8)$
14. $(k+2)(k-14)$
17. $(k+5)(k-13)$
3. $(k+2)(k-9)$
12. $(k-1)(k+35)$
23. $(k+3)(k-6)$
6. $(k-8)(k+9)$
10. $(k-2)(k+15)$
16. $(k+5)(k-7)$

Answers

8. $(x-5y)(x+16y)$
19. $(x-4y)(x+5y)$
4. $(x+2y)(x-18y)$
23. $(x+3y)(x-11y)$
21. $(x-3y)(x+11y)$
16. $(x+3y)(x-12y)$
22. $(x+6y)(x-6y)$
14. $(x-2y)(x+10y)$
13. $(x+y)(x-36y)$
11. $(x-4y)(x+9y)$
7. $(x+8y)(x-10y)$

2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26

Name_____ Date_____ Block_____

FACTORING PRACTICE

- **Trinomials (3 terms) with a=1 (x^2+bx+c)**
  - What 2 numbers multiply to make c and add to make b?

1) b^2+8b+7	**2)** $x^2+16x+64$	**3)** n^2+6n+8
4) $n^2+4n-12$	**5)** $x^2-11x+10$	**6)** $a^2+11a+18$
7) $x^2-4x+24$	**8)** p^2+p-90	**9)** b^2-6b+8
10) n^2-5n+6	**11)** $6v^2+66v+60$	**12)** $2k^2+22k+60$

pull out GCF first. then factor what's left inside the parentheses

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- **Difference of squares (2 terms) (a^2-b^2)**
  - Always factors to (a+b)(a-b)

1) p^2-36	**2)** x^2-1	**3)** $144-y^2$
4) $9x^2-1$	**5)** $16x^2-9$	**6)** n^2-121
7) $4c^2-121$	**8)** $9a^2-100$	**9)** $36k^2-1$
10) $4n^2-49$	**11)** $3n^2-75$	**12)** $2k^2-8$

Factor out GCF first, then factor what's left inside

Name_____ Date_____ Block_____

- **Factoring by grouping (4 terms)**
  - Cut problem in half (2 terms in each half)
  - Factor each half using GCF
  - Make sure that what's in parentheses matches
  - Group the factors together

1) $4v^3-12v^2-5v+15$	2) $8r^3-64r^2+r-8$	3) $12p^3-21p^2+28p-49$
4) $x^2a+x^2b-16a-16b$	5) $12x^3+2x^2-30x-5$	6) $y^3+3y^2-9y-27$
7) t^3-t^2+t-1	8) $ay^2+4y^2-9a-36$	9) $16mn-4m^2+28n-7m$
10) $4x^3+12x^2-9x-27$	11) $6x^2-24x+2xy-8y$	12) $105n^3+175n^2-75n-125$

Pull out GCF first, then factor what's left inside

What Happened to the Baseball Player Who Was Unfaithful to His Wife?

Write the trinomial in factored form. Find the factors in the two columns of binomials. One factor will have a letter and the other a number. Write the letter in the matching numbered box at the bottom of the page.

Set 1

a. $3x^2 + 5x + 2$

b. $2x^2 + 7x + 3$

c. $7x^2 - 9x + 2$

d. $3x^2 - 16x + 5$

e. $6x^2 + 11x + 3$

Set 1 Answers

15 $(x + 2)$	H $(x - 1)$
12 $(x + 1)$	E $(2x - 1)$
5 $(2x + 3)$	O $(x + 3)$
9 $(7x - 2)$	T $(x - 5)$
23 $(2x + 1)$	W $(3x + 2)$
13 $(3x - 2)$	S $(7x + 1)$
17 $(3x - 1)$	A $(3x + 1)$

Set 2

a. $8b^2 + 6b + 1$

b. $8b^2 - 9b + 1$

c. $6b^2 + 13b + 2$

d. $12b^2 - 13b + 3$

e. $3b^2 + 14b + 8$

Set 2 Answers

19 $(3b + 2)$	R $(2b + 3)$
11 $(4b - 1)$	H $(4b - 3)$
25 $(2b + 1)$	S $(b - 1)$
15 $(b + 2)$	A $(b + 4)$
1 $(3b - 1)$	O $(6b + 1)$
16 $(b + 8)$	E $(4b + 1)$
6 $(8b - 1)$	T $(3b + 4)$

Set 3

a. $5k^2 + 4k - 1$

b. $2k^2 - 5k - 3$

c. $3k^2 + 2k - 5$

d. $7k^2 - 13k - 2$

e. $10k^2 - 3k - 1$

Set 3 Answers

4 $(k - 2)$	E $(2k + 1)$
22 $(7k + 2)$	N $(3k + 5)$
2 $(k - 3)$	S $(10k - 1)$
10 $(2k - 3)$	O $(k + 1)$
13 $(k - 1)$	T $(5k + 1)$
11 $(5k - 1)$	W $(7k + 1)$
20 $(2k - 1)$	L $(3k - 5)$

Set 4

a. $6v^2 - 7v - 3$

b. $5v^2 + 18v - 8$

c. $4v^2 - 15v + 9$

d. $3v^2 + 16v - 12$

e. $8v^2 - 14v - 15$

Set 4 Answers

21 $(5v + 4)$	R $(4v + 3)$
16 $(4v - 3)$	H $(5v - 2)$
10 $(2v - 5)$	M $(v + 6)$
8 $(3v + 1)$	S $(4v - 5)$
14 $(2v - 1)$	U $(v - 3)$
22 $(v + 4)$	N $(3v - 4)$
24 $(3v - 2)$	T $(2v - 3)$

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25

Name_____

Date_____Block_____

FACTORING - TRINOMIALS WITH A≠1

1. $2b^2+17b+21$

2. $3p^2-2p-5$

3. $5x^2-18x+9$

4. $16x^2+60x-100$

5. $3x^2+7x+2$

6. $3x^2-2x-5$

7. $7x^2-9x+2$

8. $4x^2+8x+4$

9. $2x^2-x-3$

10. $3x^2+16x+5$

11. $2x^2-9x+7$

12. $6x^2-x-15$

13. $30n^2b-87nb+30b$

14. x^4-10x^2+9

15. $2x^5-7x^3-4x$

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Factoring- Mixed Practice

1. $x^2 + 8x + 16$

2. $2n^2 + n - 6$

3. $x^2 - 9$

4. $3(x + y) + a(x + y)$

5. $b^2 - 2b - 3$

6. $s^2 - 4s - 5$

7. $2x^5 + 6x^4 - 8x^3 + 10x^2$

8. $x(a + 2) - 2(a + 2)$

9. $4m^2 - 1$

10. $x^2 + 12x + 32$

11. $2x^3 + 6x^2 - 2x$

12. $y^2 + 6y + 8$

13. $2x^2 + 5x + 3$

14. $x^2 - 22x + 121$

15. $a(y + 1) - b(y + 1)$

16. $2x^2 + 3x + 1$

17. $12x^2 + 8x - 28$

18. $3x^2 - x - 4$

19. $a^2 + 3a + 2$

20. $5x^2 - 2x - 7$

21. $2y^2 - 9y - 5$

22. $m(x - 3) + k(x - 3)$

23. $d^2 + 8d + 7$

24. $n^2 - 4$

25. $3c^2 - 17c - 6$